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(पहला पुनरीक्षण)

Indian Standard

ELECTROTECHNICAL VOCABULARY

PART 28 INSTRUMENT TRANSFORMERS

(First Revision)

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This Indian Standard (Part 28) (First Revision) which is identical with IEC Pub 50 (321) (1986) 'International electrotechnical vocabulary — Chapter 321 : Instrument transformers', issued by the International Electrotechnical Commission (IEC), was adopted by the Bureau of Indian Standards on the recommendation of Basic Electrotechnical Standards Sectional Committee,ET 01 and approval of the Electrotechnical Division Council.

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Only the English text given in the IEC publication has been retained while adopting as Indian Standard, and as such the page numbers given here are not the same as in IEC Publication.

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ELECTROTECHNICAL VOCABULARY

PART 28 INSTRUMENT TRANSFORMERS

(First Revision)

INTRODUCTION

In its present state, this chapter deals only with conventional wound type (or having wound parts) instrument transformers intended to be used with measuring apparatus or protection devices. In the future, it will be updated to take into account the introduction of new types of instrument transformers with a more general title.

Unless otherwise stated, the functional characteristics, such as errors, rated currents and so on are valid in the case of sinusoidal currents and voltages under steady state conditions and the values of current and voltages appearing in the terms and definitions are r.m.s. values.

SECTION 321-01 — GENERAL AND COMMON TERMS

321-01-01

instrument transformer

A transformer intended to transmit an information signal to measuring instruments, meters and protective or control devices.

Note. —The term 'instrument transformer' encompasses both current transformers (*see* Section 2) and voltage transformers (*see* Section 3).

321-01-02

instrument autotransformer

An instrument transformer in which the primary and the secondary windings have a common part.

321-01-03

combined transformer

An instrument transformer consisting of a current and a voltage transformer in the same case.

321-01-04

primary winding (of a current transformer)

The winding through which flows the current to be transformed.

321-01-05

primary winding (of a voltage transformer)

The winding to which is applied the voltage to be transformed.

321-01-06

secondary winding (of a current transformer)

A winding which supplies the current circuits of measuring instruments, meters, protective or control devices.

321-01-07

secondary winding (of a voltage trasnsformer)

A winding which supplies the voltage circuits of measuring instruments, meters, protective or control devices.

321-01-08

secondary curcuit

The external circuit receiving the information signals supplied by the secondary winding of an instrument transformer.

321-01-09

primary current (of a current transformer)

The current which flows through the primary winding of a current transformer.

321-01-10

primary voltage (of a voltage transformer)

The voltage which is applied to the primary winding of a voltage transformer.

321-01-11

rated primary current (of a current transformer)

The value of the primary current which appears in the designation of a current transformer and on which its performance is based.

321-01-12

rated primary voltage (of a voltage transformer)

The value of the primary voltage which appears in the designation of a voltage transformer and on which its performance is based.

321-01-13

secondary current (of a current transformer)

The current which flows through the secondary winding of a current transformer when current is passed through the primary winding.

321-01-14

secondary voltage (of a voltage transformer)

The voltage which occurs at the terminals of the secondary winding of a voltage transformer when a voltage is applied to the primary winding.

321-01-15

rated secondary current (of a current transformer)

The value of the secondary current which appears in the designation of a current transformer and on which its performance is based.

321-01-16

rated secondary voltage (of a voltage transformer)

The value of the secondary voltage which appears in the designation of a voltage transformer and on which its performance is based.

321-01-17

actual transformation ratio of a current transformer

The ratio of the actual primary current to the actual secondary current of a current transformer.

321-01-18

actual transformation ratio of a voltage transformer

The ratio of the actual primary voltage to the actual secondary voltage of a voltage transformer.

321-01-19

rated transformation ratio of a current transformer

The ratio of the rated primary current to the rated secondary current of a current transformer.

321-01-20

rated transformation ratio of a voltage transformer

The ratio of the rated primary voltage to the rated secondary voltage of a voltage transformer.

321-01-21

current error

The error which a current transformer introduces into the measurement of a current and which arises from the fact that the actual transformation ratio is not equal to the rated transformation ratio.

321-01-22

voltage error

The error which a voltage transformer introduces into the measurement of a voltage and which arises from the fact that the actual transformation ratio is not equal to the rated transformation ratio.

321-01-23

phase displacement

The difference in phase between the primary and secondary currents (or voltages), the positive direction of the primary and secondary currents (or voltages) being so chosen that this difference is zero for a perfect transformer.

Note.—The phase displacement is said to be positive when the secondary current (voltage) leads the primary current.

321-01-24

accuracy class

A designation assigned to an instrument transformer the current (or voltage) error and phase displacement of which remain within specified limits under prescribed conditions of use..

321-01-25

burden (of an instrument transformer)

The impedance of the secondary circuit.

Note.— The burden is usually expressed as the apparent power absorbed by the secondary circuit at a specified power factor at the rated secondary current (or voltage).

321-01-26

rated burden

The value of the burden on which the accuracy requirements of a specification are based.

321-01-27

rated output (of an instrument transformer)

The value of the apparent power at a specified power factor which the instrument transformer is intended to supply to the secondary circuit at the rated secondary current (or voltage) and with rated burden connected to it.

SECTION 321-02 — CURRENT TRANSFORMERS

321-02-01

current transformer

An instrument transformer in which the secondary current, in normal conditions of use, is substantially proportional to the primary current and differs in phase from it by an angle which is approximately zero for an appropriate direction of the connections.

321-02-02

bushing type current transformer

A current transformer without primary conductor and primary insulation of its own which can be fitted directly over an insulated bushing or conductor.

321-02-03

bus type current transformer

A current transformer without primary conductor, but with primary insulation, which can be fitted directly over a conductor or busbar.

321-02-04

cable type current transformer

A current transformer without primary conductor and primary insulation of its own, which can be mounted over an insulated cable.

321-02-05

split core type current transformer

A current transformer without primary conductor, and primary insulation of its own, the magnetic circuit of which can be hinged open (or otherwise separated into two parts) and then closed around the insulated conductor carrying the current to be measured.

321-02-06

bar primary type current transformer

A transformer in which the primary conductor is made up of a bar or a set of bars in parallel.

321-02-07

bar primary bushing type current transformer

A current transformer so constructed that it can be used as a bushing.

321-02-08

support type current transformer

A current transformer so arranged that it acts as a support for the conductor in the primary circuit.

321-02-09

wound primary type current transformer

A current transformer in which the primary winding consists of a single or multi-turn coil.

321-02-10

fully insulated current transformer

A current transformer having as an integral part of its construction, insulation suitable for its rated insulation level.

321-02-11

extended rating type current transformer

A current transformer having a rated continuous thermal current higher than rated primary current and for which accuracy requirements are prescribed at that current.

321-02-12

single-core type current transformer

A current transformer in which only one magnetic core with one secondary winding and one primary winding are provided.

321-02-13

multi-core type current transformer

A current transformer comprising a number of magnetically separated cores with individual secondary windings and a common primary winding.

321-02-14

compound-wound current transformer

A current transformer having an auxiliary winding with an independent supply especially intended to reduce the phase displacement between the primary and secondary currents.

321-02-15

auto-compound current transformer

A current transformer having an auxiliary winding in series with the secondary of the transformer, especially intended to reduce the phase displacement between the primary and secondary currents.

321-02-16

summation currrent transformer

A transformer for the measurement of the sum of the instantaneous values of currents having the same frequency within a power system.

321-02-17

current matching transformer

A current transformer for matching the rated secondary current of the main current transformer to the rated current of the burden or for reducing the instrument security factor.

321-02-18

measuring current transformer

A current transformer intended to transmit an information signal to measuring instruments and meters.

321-02-19

protective current transformer

A current transformer intended to transmit an information signal to protective and control devices.

Note.—The accuracy class of a protective current transformer is designated by its class index followed by the letter 'P' (standing for 'Protection'). The class index gives the limit of the absolute value of composite error at the rated accuracy limit primary current for the class concerned, as a percentage of this current.

321-02-20

residual current

The sum of the instantaneous values of all three line currents in a three phase system.

321-02-21

residual current transformer

A single, or a group of three, current transformer(s) so connected as to transform only the residual current.

321-02-22

rated short time thermal current

The maximum value of the primary currrent which a transformer will withstand for a specified short time without suffering harmful effects, the secondary winding being short-circuited.

321-02-23

extended rating current

The highest value of the primary current expressed as a percentage of primary rated current at which an extended rating type current transformer complies with the temperature rise and accuracy requirements.

321-02-24

rated dynamic current

The maximum peak value of the primary current which a transformer will withstand without being damaged electrically or mechanically by the resulting electromagnetic forces, the secondary winding being shortcircuited.

321-02-25

rated continuous thermal current

The value of the current which can be permitted to flow continuously in the primary winding the secondary winding being connected to the rated burden without the temperature rise exceeding the values specified.

321-02-26

composite error

Under steady-state conditions, the r.m.s. value of the difference between

a) the instantaneous values of the primary current, and

b) the instantaneous values of the actual secondary current multiplied by the rated transformation ratio,

the positive signs of the primary and secondary currents corresponding to the convention for terminal markings.

Note. – The composite error is generally expressed as a percentage of the r.m.s. value of the primary current.

321-02-27

rated instrument limit primary current (IPL)

The value of the minimum primary current at which the composite error of the measuring current transformer is equal to or greater than 10%, the secondary burden being equal to the rated burden.

321-02-28

instrument security factor (FS)

The ratio of rated instrument limit primary current to the rated primary current.

321-02-29

rated accuracy limit primary current (of a protective current transformer)

The value of primary current up to which the current transformer will comply with the requirements for composite error.

321-02-30

accuracy limit factor (of a protective current transformer)

The ratio of the rated accuracy limit primary current to the rated primary current.

321-02-31

secondary limiting e.m.f.

The product of the instrument security factor, the rated secondary current and the vectorial sum of the rated burden and the impedance of the secondary winding.

321-02-32

exciting current

The r.m.s. value of the current taken by the secondary winding of a current transformer when a sinusoidal voltage of rated frequency is applied to the secondary terminals, the primary and any other windings being open circuited.

321-02-33

internal burden (of a current transformer)

The impedance of the secondary winding.

321-02-34

knee point voltage

The r.m.s. value of the sinusoidal voltage at rated frequency applied to the secondary terminals of the transfomer, all other windings being open circuited, which when increased by 10% causes the r.m.s. value of the exciting current to increase by 50%.

321-02-35

turns correction

A design feature of a current transfomer in which the turns ratio differs from the rated transformation ratio.

SECTION 321-03 — VOLTAGE TRANSFORMERS

321-03-01

voltage transformer

An instrument transformer in which the secondary voltage, in normal conditions of use, is substantially proportional to the primary voltage and differs in phase from it by an angle which is approximately zero for an appropriate direction of the connections.

321-03-02

unearthed voltage transformer ungrounded voltage transformer (USA)

A voltage transformer which has all parts of its primary winding including terminal insulated from earth at a level corresponding to its rated insulation level.

321-03-03

earthed voltage transformer grounded voltage transformer (USA)

A single-phase voltage transformer which is intended to have one end of its primary winding directly earthed or a three phase voltage transformer which is intended to have the star point of its primary winding directly earthed.

321-03-04

measuring voltage transformer

A voltage transformer intended to transmit an information signal to measuring instruments and meters.

321-03-05

protective voltage transformer

A voltage transformer intended to transmit an information signal to protective and control devices.

Note. — The accuracy class of a protective voltage transformer is designated by its class index followed by the letter 'P' (standing for ' Protection '). The class index gives the limit of the absolute value of the voltage error from 5% of rated voltage to a voltage corresponding to the rated voltage factor.

321-03-06

dual purpose voltage transformer

A voltage transformer having one magnetic core intended to serve the dual purpose of measuring and protection. It may have one or more secondary windings.

321-03-07

cascade (inductive) **voltage transformer**

A voltage transformer in which the primary winding is equally distributed over two or more insulated magnetic cores suitably electromagnetically coupled. Power is thereby transmitted to the secondary winding which is placed on the core on which are disposed windings at the potential nearest to earth.

321-03-08

voltage matching transformer

A voltage transformer for matching the rated secondary voltage of the main voltage transformed to the rated voltage of the burden.

321-03-09

residual voltage

The sum of the instantaneous values of all three line-to-earth voltages, in a three-phase system.

321-03-10

residual voltage transformer

A three-phase voltage transformer or a group of three single-phase voltage transformers having secondary windings connected in broken delta so as to produce between the appropriate terminals a voltage representative of the residual voltage existing in the three-phase voltages applied to the primary terminals.

321-03-11

residual voltage winding

The winding of a transformer between the terminals of which is produced the residual voltage or one of the three component voltages which when added together constitute the residual voltage.

321-03-12

rated voltage factor

The multiplying factor to be applied to the rated primary voltage to determine the maximum voltage at which a transformer must comply with the relevant thermal requirements for a specified time and with the relevant accuracy requirements.

321-03-13

secondary limiting thermal current

The maximum continuous secondary current at the highest voltage for equipment which the transformer can supply without the termperature of any part exceeding the stipulated temperature limits.

321-03-14

capacitor voltage transformer

A voltage transformer comprising a capacitor divider unit and an electromagnetic unit so designed and interconnected that the secondary voltage of the electromagnetic unit is substantially proporational to the primary voltage, and differs in phase from it by an angle which is approximately zero for an appropriate direction of the connections.

321-03-15

capacitor voltage divider

A voltage divider consisting only of capacitors.

321-03-16

high voltage terminal

Terminal intended to be connected to the power line.

321-03-17

low voltage terminal (of a capacitor voltage transformer)

Terminal intended to be connected to the earth, either directly, or through a carrier-frequency transmission circuit.

321-03-18

intermediate voltage terminal (of a capacitor voltage transformer)

Terminal to be connected to the electromagnetic unit of a capacitor voltage transformer.

321-03-19

high voltage capacitor (of a capacitor voltage transformer)

Capacitor connected between the high voltage and intermediate voltage terminals.

321-03-20

intermediate voltage capacitor (of a capacitor voltage transformer)

Capacitor connected between the intermediate voltage terminal and the low voltage terminal.

321-03-21

electromagnetic unit (of a capacitor voltage transformer)

The component of a capacitor voltage transformer connected between the intermediate voltage terminal and the low voltage terminal of the capacitor divider or the earth, and which produces the secondary voltage.

321-03-22

open-circuit intermediate voltage

The voltage to earth at the intermediate voltage terminal of the capacitor divider unit when primary voltage is applied between the high voltage terminal and the low voltage terminal or the earth, the electromagnetic unit being disconnected.

321-03-23

voltage ratio of a capacitor divider

Ratio between the sum of the capacitances of the high voltage and intermediate voltage capacitors and the capacitances of the high voltage capacitor.

321-03-24

protective device (of a capacitor voltage transformer)

A device incorporated in a capacitor voltage transfomer for the purpose of limiting overvoltages which may appear across one or more of its components, notably due to ferroresonance phenomena.

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